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Symposium:
Anaesthesia and its Application in Small-animal Practice *

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Anaesthesia for the Poor-risk Small-animal Patient

BY
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ALL cases for anaesthesia must be examined with a view to assessing the degree of risk involved. Disease may be detected in one or more of the systems of the body, and I would like, this morning, to discuss—only, I am afraid, in very general terms—the influence of renal, hepatic, respiratory, and cardio-vascular disease on the anaesthetic problem. For very many cases it will be apparent that all possible anaesthetic techniques are evil, and it will be necessary to choose the least evil, but often one is able to decide that certain techniques, for example spinal or epidural block, are definitely contra-indicated, or only possible if certain precautions are taken.

Disease of the Kidney

Kidney disease is, of course, relatively common in the small-animal patient. Traumatic shock and severe bleeding at operation result in vasoconstriction in the body generally, and this includes the kidney. I do not wish to enter into any discussion about whether the renal shunt mechanism of Trueta actually does occur clinically, but all authorities seem to be agreed that vasoconstriction occurs in the kidney. If this vasoconstriction persists for any length of time anoxic damage will follow. Tolerance to this vaso-constriction is decreased where renal disease already exists before the time of operation. Thus renal failure may result from inadequate supportive therapy at the time of operation or anaesthesia. Anoxia itself and, it is claimed, CO_2 retention in the body, also have a similar effect and must be avoided.

It is interesting to note, however, that hypotension due to spinal or epidural block or the use of ganglionic blocking agents is *not* harmful since it is always associated with maximal renal vasodilation. Under these conditions the arterio-venous oxygen difference is increased indicating that in spite of a slower circulation the uptake of oxygen by the tissues is unchanged.

As far as anaesthetic agents are concerned it should be remembered that:—

Both chloroform and ether cause cloudy swelling and epithelial desquamation in the kidney tubules and are perhaps best avoided.

It should be remembered too that a high blood area has been shown to potentiate barbiturate narcosis. Thus only minimal doses of these drugs should be used.

In actual fact kidney damage must, in my experience, be very advanced before it greatly increases the anaesthetic risk. However, I think it always pays to be cautious in prognosis if renal disease exists. In the dog anaesthesia and operation may coincide with a "flare-up" of a chronic nephritis case, and this "flare-up" may easily be exacerbated by these interferences with the metabolism of the body.

Disease of the Liver

Liver disease is serious. The liver has a wonderful reserve of function but by the time symptoms of disease are apparent the liver is in very poor shape. In such circumstances one should consider very carefully whether the contemplated operation really is necessary.

In my experience if liver disease is present, careful pre-operative preparation is necessary. The functional reserve of the liver can be "boosted" by a diet high in methionine-milk and cheese. Carbohydrates and protein may also be given in large quantities.

* The four papers comprising this symposium were read to the Central Veterinary Society on April 5th, 1956.

Liver disease will present surgical as well as anaesthetic problems. The surgical problem is principally due to an increase in the bleeding time resulting from a low blood prothrombin; and I have seen a dog operated on for the removal of a mammary neoplasm bleed to death from this cause.

The anaesthetic problems are mainly those of detoxication. Of the barbiturates, thiopentone is the only one with a fair tolerance since it seems to be broken down elsewhere in the body besides in the liver. Chloroform is, of course, quite contra-indicated, since we all know of the harmful effects of this agent on the liver. Again, the damaged liver does not tolerate anoxia at all well.

Respiratory Disease

Respiratory disease may be classified as acute or chronic.

Acute respiratory disease. If anaesthesia is essential it would seem to be logical to avoid irritant inhalational anaesthetic agents. However, I must confess that I have on occasion used ether without apparently harmful effect in animals suffering from pneumonia.

It must, of course, always be remembered that areas of the lung may be consolidated due to the pneumonic process and these consolidated areas act as venous-arterial shunts. In this way the oxygenating function of the lungs may be severely curtailed. Inhalation of high concentrations of oxygen is always helpful to these animals when their respiration is farther embarrassed by the respiratory depressant action of anaesthetics.

Chronic respiratory disease. Under the heading of chronic respiratory disease we must include such conditions as empyaema, chylo-thorax, chronic bronchitis, and bronchiectasis. Many of these cases require anaesthesia for investigation purposes. General anaesthesia may be necessary for X-ray, bronchoscopy, and bronchography. Diagnostic investigation of dogs suffering from chronic cough always presents a problem to me. These unfortunate dogs appear to be especially liable to develop laryngeal spasm, bronchospasm, and cardiac irregularities during the anaesthetic period.

One case, which I had to anaesthetise for a bronchoscopy about a month ago gave me a very bad fright. The dog was a five-year-old Corgi bitch which had suffered from a chronic cough for the past four months. She belonged to a doctor, and it is my experience that dogs belonging to members of the medical profession often do alarming things when anaesthetised by methods which give no trouble when applied to other dogs!

Premedication in this case consisted of chlorpromazine mg. 12.5 and atropine gr. 1/100 given intramuscularly at 3.30 p.m. The bitch weighed 25 lb. and I started to induce anaesthesia with thiopentone sodium at 4.45 p.m. Venepuncture was difficult—more so than usual in Corgis since blood sampling had been carried out on the previous day. Consciousness was lost after 2 ml., *i.e.* 0.1 g. of thiopentone had been injected. Respiration ceased, and since this always happens, gave no cause for immediate alarm. However, apnoea persisted on this occasion and the bitch showed rapidly developing cyanosis. I realised that something was very much amiss. I pulled the tongue forward and assured myself that the airway was clear, and applied pressure to the chest. The chest cage was rigid and I was unable to respirate the dog by the application of pressure to the chest wall. Examination of the larynx showed intense spasm of the vocal cords, and since I had seen this picture before, I recognised that I was dealing with a case of bronchospasm and associated laryngospasm. The intravenous administration of a relaxant or spasmolytic drug did not seem to be feasible and I was forced to look for other measures. I ensured that I had an endotracheal tube connected up to a rebreathing bag and that a good flow of oxygen was being delivered from the anaesthetic machine through the tube. Then I waited for the spasm to relax. The text-books say that the spasm passes off before death occurs, and I waited with the tube poised, ready to slip it between the vocal cords and down the trachea as soon as the spasm relaxed. In the meantime all I could do was to hope that the dog's heart was capable of standing anoxia. After about 90 seconds the spasm of the cords ceased and I inserted the endotracheal tube. I was still unable to force any gases into or out of the lungs—pressure on the chest wall was ineffective and squeezing of the rebreathing bag also failed to effect artificial respiration. The dog was by now very cyanosed, the heart was very forceful, and the pulse bounding. Although I was unable to ventilate the lungs artificially, the oxygen issuing from the endotracheal tube must have resulted in some degree of diffusion respiration, for over the next two minutes the dog's colour steadily improved and then spontaneous respiratory movements commenced. I assisted these movements by gentle squeezing of the rebreathing bag at each inspiration, until after a further minute respiration was normal and the colour a healthy pink. I then removed the endotracheal tube, sprayed the pharynx, larynx, and tracheobronchial tree with 4 per cent. lignocaine* solution and the bronchoscopy was then carried out without further trouble. Recovery from anaesthesia was uneventful.

I do not know if I dealt with this emergency as efficiently as I might have done, but to me it emphasised two things. First, emergencies such as this happen without warning. Secondly, it showed me the danger of drawing any conclusions from any small series of cases. Up to the time of this case I had used chlorpromazine for premedication of 386 cases and I was coming to the conclusion that bronchospasm just did not occur after chlorpromazine premedication. Now I know that it *can* occur! I am wondering just how large a series of cases must be before any conclusions can be drawn from them.

Disease of the Cardiovascular System

Disease of the heart. Heart disease is fairly common in dogs, and it is my experience that, although the presence of a cardiac lesion does increase the anaesthetic risk in most instances, the increase in risk is only minimal. If certain precautions are taken

* Xylocaine.

the only cases of heart disease which need cause concern to the anaesthetist are those cases in which there is a decreased exercise tolerance.

Anaesthetic techniques which involve hypotension are definitely contra-indicated, since adequate coronary circulation (and hence O_2 supply to the heart muscle) is dependent chiefly on the mean diastolic pressure, *and if this falls unduly, coronary circulation fails.*

Great care is necessary if transfusions are to be given—if given too rapidly they will overload the right heart.

The premedication should aim at producing a well-sedated animal to minimise adrenaline release and consequent increased oxygen demands. Pethidine in fairly heavy doses, or smaller doses of pethidine combined with chlorpromazine is our usual routine. Atropine and hyoscine which result in tachycardia from removal of vagal tone are perhaps better omitted. I find that pethidine itself has fairly good drying power. Morphine may produce vomiting which can impose a severe strain on the heart.

Induction of anaesthesia should, I think, always be with an intravenous barbiturate to avoid struggling. The drug must be given slowly since it must be remembered that there is usually an increased circulation time. For maintenance of anaesthesia, ether/oxygen or nitrous oxide/oxygen ether with plenty of oxygen do very well. Respiratory depression and carbon dioxide retention must be avoided.

Anaesthesia is never without risk to the patient, but cardiac disease does not always increase the risk. Never mind the adventitious sounds heard on auscultation; base your judgment on the exercise tolerance test, take the precautions I have mentioned, and it has been my experience that dogs suffering from heart disease tolerate anaesthesia very well.

Shock

This discussion would not be complete if I did not mention anaesthesia for the shocked patient. Shock is a vast subject and to me it is a subject which appears to be very poorly understood. We might define shock as the state in which there is a decreased circulating blood volume so that the normal vascular bed can no longer be completely filled. There is not time enough to delve deeply into the question of anaesthesia for the shocked animal but perhaps a few remarks might be timely here.

Certain anaesthetic techniques are rather unsafe when dealing with shocked animals. Spinal or epidural block, which will of course result in vasodilatation and thus an increase in the vascular bed are, in my opinion, best avoided. Attempts to control the fall in blood pressure with vasopressor drugs are very much a hit or miss procedure, and a miss, in my experience, is usually fatal for the patient.

The intravenous barbiturates also cause a vasodilatation, but used cautiously they are very useful. The significant points seem to be to *use only minimal doses given very slowly,* to aim at very light levels of anaesthesia, and to administer oxygen by inhalation always making sure that the airway is clear. For relaxation of the muscles a relaxant can be used if facilities for artificial respiration are available, but in their absence muscle relaxation can be assured by a regional or local field block with local analgesics.

One factor which aggravates shock and which should not be overlooked is that of mental trauma. This, in my opinion, limits the use of local analgesia to very minor operations; and since, in any case, it is difficult to maintain asepsis when the animal is conscious, I tend to fight shy of using local analgesia alone.

Case records in the form of slides were then shown by the essayist.

I feel it would be proper here to acknowledge the help and co-operation which I receive from my surgical colleagues. It is especially in the poor risk case that co-operation is essential. We are not satisfied with our results and we are continually striving to achieve more satisfactory ones. The results which I have just shown you were not achieved by any " one man band " effort, but by team-work and mutual assistance. Clinical impressions are notoriously dangerous things, and we find that when we become particularly enthusiastic over any technique we are soon brought down to earth by referring back to our records. Then we talk things over both from the surgical and anaesthetic viewpoint, and we believe that in this way we are making steady if somewhat slow progress.

In conclusion the essayist showed a film on the subject of endotracheal intubation.

A Practitioner's View of Current Anaesthetic Methods

BY

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AFTER listening to Mr. Hall's remarks on the risks, and the various actions of anaesthetics on the organs in an animal's body, I feel rather frightened. We all know the chief object of an anaesthetic is to relieve pain, but in practice it is also necessary to keep the anaesthetic as simple as possible in order that lay staff may give it if necessary under the directions of a veterinary surgeon. We must remember, also, that animals may not co-operate, and therefore some form of restraint may be necessary.

In my practice I have a colleague and a lay staff of two, and the number of anaesthetic cases each year is in the region of 1,100—only a small proportion of the number of cases I see during the year.

One may divide anaesthetics under various headings, starting with local anaesthetics. Surface anaesthesia is limited but useful. I use it for castrations in kittens, broken claws, loose teeth, warts, and for suturing small wounds. In my view the danger of necrosis with the use of ethyl chloride is overestimated. I have found Butyn eye-drops useful in the removal of grass seeds from the eye. As to local anaesthetics by injection, I prefer the type containing adrenalin. Some types of local anaesthetics produce severe irritation on injection, and I try to avoid these. Additionally I avoid injecting more than 15 c.c.

because, if an operation to remove a tumour, for example, requires more than this, I prefer to use a general anaesthetic. The use of local anaesthetic to carry out a nerve block on the leg is convenient when a cut leg or a pad requires a few sutures.

For general anaesthetics, though I use many types I prefer thiopentone sodium* given intravenously. Results have been very good with this, and I use it in animals of all ages, including heart and kidney cases. Pre-sedation is sometimes used, though I prefer to give a rapid injection at the beginning, which produces quick unconsciousness and avoids excitement. In the case of a big dog I often use 1 or 1½ gm. of Pentothal in 10 c.c. of sterile water, and this concentration seems to have no ill-effects provided that the administrator remembers the strength of the solution.

I prefer to use a glass syringe and a sharp needle; it is false economy to use a blunt one. Often the Pentothal is given continuously, and for this, in the dog, a fairly wide-bore needle is used to avoid blockage. In the cat, however, a needle with a narrow bore is always used, on account of the small size of the vein. It is possible, with the continuous method, to keep the animal under for an hour or more, as for example, in an accident case when X-rays can be taken, and a plaster put on if a limb is broken. In passing I should like to draw the attention of manufacturers to producing a better quality glass in the phials used to contain the anaesthetic powder. I have received some nasty cuts owing to the whole thing disintegrating in my hand. I wondered whether it is possible to have rubber caps on the phials as in penicillin?

I do not use pentobarbitone sodium† very much as it seems to vary. In these days it seems to require almost double the amount of material to achieve the same results as was the case a few years ago; I do, however, find pentobarbitone sodium useful in hamsters and guinea-pigs.

Ether oxygen has been used on many occasions, especially after initial use of thiopentone sodium. The type of apparatus is the standard equipment as supplied by the British Oxygen Company; but it is complicated to use, and not easy for a lay person to handle even under supervision. There seem to be so many knobs to turn and dials to watch which tends to complicate matters unless one is assisted by a colleague.

Regarding diephylthiambutene hydrochloride‡ some people have found it useful, but my results have not been good. It is depressing, and on the second and third days after administration, the animal is not normal. Sometimes a worried owner telephones to the surgery and a visit has to be made—a type of extra work which is annoying in a busy practice. My only successful case was with a Scottie, with bad teeth, owned (rather coincidentally) by a dentist. As it was inclined to bite, and was an old dog, I used the maximum dose to achieve deep sedation. All went well until half-way through the operation when it was noticed that respiration ceased, and it was necessary to give the antidote. Half-way through giving this, intravenously, I was amazed to find the animal recovering consciousness rapidly, and biting at my fingers!

I have not tried certain other types of anaesthetic, such as trichloroethylene§, and I will not go into the use of spinal anaesthesia, as Miss Joshua is giving a talk on this subject this afternoon. To sum up, I have not tried to teach you anything new; my idea has been to remind you of what is wanted in practice; effectiveness and simplicity. One cannot afford to have bad results, or experiment with untried products.

* Pentothal.
† Nembutal.
‡ Themalon.
§ Trilene.

Physiological Principles in Modern Anaesthesia

BY

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I HAVE chosen the physiological basis of anaesthetic techniques as a subject because it is common ground to both veterinary and human anaesthesia; indeed, it is the veterinary anaesthetists who have taught us much of what we know about the physiology of the subject.

At first glance some of the modern anaesthetic techniques seem both daring and heretical, but when examined in the light of physiology they become more rational. They are made necessary by the rapid advances in surgery in both fields, advances which undoubtedly have been made possible by improved anaesthesia.

The days when any anaesthetic which produced unconsciousness was satisfactory are long since past; in fact producing sleep seems to be the least, rather than the most, important of our functions. Let us examine the duties of a modern anaesthetist, for they extend far outside the limits of the operating theatre. By virtue of his training the anaesthetist is both a physician and a surgeon, he has a foot in both camps. In the team of which he should be an integral part, he is, therefore, of value in assessing the fitness of a patient for a given operation.

Should the patient be unfit, it often falls to him to treat the subject medically and make him well enough for the surgery and the anaesthetic. This is where a good understanding between the surgeon and anaesthetist is of such value as they can together plan the best tactics to adopt. In human subjects the history of their everyday life is just as important as a detailed physical examination in assessing a patient's reserve. Any woman who can by herself run a home with two children is fit for most things whatever queer noises her heart makes! One exception is a case of aortic incompetence. Despite a good exercise tolerance a fall in diastolic pressure may result in a state of fatal myocardial ischaemia rendering these subjects a bad anaesthetic risk.

Premedication

This consists of two important parts, the psychological, and pharmacological; and of these the former

is by far the more important. One of the main effects of an anaesthetic agent is to lower the metabolism of the central nervous system. As we know, anxiety does just the reverse. Obviously therefore, the reduction of the patient's fears by a careful explanation of what is going to happen is well worth while. This, I am sure, must be equally true in veterinary practice where the same thing can be done by skilful handling of the animal. I stress this factor because it is so important and so easily forgotten in the hurly-burly of hospital routine. Quite apart from unnecessary mental suffering and disruption of the smoothness of the anaesthesia, fear can spoil the operating conditions by increasing the tendency to haemorrhage. Much work has been done on this subject by Macfarlane of Oxford, who has demonstrated fibrinolysins in the serum of patients who were subjects of fear and of certain anaesthetic and pre-anaesthetic drugs.

From the pharmacological aspect, this concept of lowering the body metabolism is the basis of the work of Laborit and his French colleague Hugenard on hibernation. Although expounded as a method of anaesthesia, the technique of hibernation is really an extended form of premedication or basal narcosis. A mixture of drugs commonly known as the " Lytic Cocktail " is used before and during anaesthesia. The main action of this mixture of chlorpromazine, promethazine, and pethidine is on the autonomic nervous system, particularly on its centre the thalamus. By depressing this centre, the body metabolism and the level of consciousness is lowered. A secondary result of this thalamic depression is a marked lowering of blood pressure, more as a result of depression of the vasomotor centre than of ganglionic blockade. This, with the addition of careful posturing, will produce a relatively dry operating field. An even more useful effect of this technique is that it may help the patient to survive shock.

Mechanisms of Shock

This is no digression from the subject of anaesthesia, for a clear understanding of the mechanisms of shock is of vital importance to the anaesthetist. The word is used rather loosely to cover all forms of collapse in the pre-operative, operative, and post-operative period.

I think it is fair to say that as far as the anaesthetist is concerned there are two main causes of shock—or circulatory collapse as it might be called. One is noxious stimuli, such as intense pain or severe trauma, and the other is failure of venous return to the heart. This includes both haemorrhage, when the blood is lost altogether, and also sudden pooling due to venous obstruction or venous atonia when the blood is only " lost " temporarily.

The first kind, neurogenic shock, was described by Crile many years ago. He explained it by saying that the vasomotor centre becomes paralysed as a result of its bombardment with many stimuli. Many people to-day claim that under light anaesthesia this does not happen, but I think no one who has given an anaesthetic for a major operation, particularly if it involves the pelvic floor, can deny that neurogenic shock certainly does happen and it may sometimes be a very serious thing. This kind of shock is preventable in a number of ways which I will explain later, but if it is not prevented it is very difficult to treat and usually requires blood transfusion. If there has been but little blood-loss this is merely a palliative measure and may lead to a disturbance of tissue-fluid balance. Shock due to loss of circulating blood is best treated by restoration of the blood volume by transfusion; but it may be temporarily averted in an emergency by giving vasopressor drugs. Whatever the cause of the shock, the fact remains that in this condition there is a lack of circulating blood volume.

Unless prevented from so doing, the body reacts to shock by attempting to maintain the circulation of the hind-brain and myocardium at the expense of other organs; and it is the ischaemic damage which results from this compensatory vasospasm in organs like the kidneys, the liver, and the retina, which is the main danger of a low blood pressure. Providing the arterioles and capillaries remain dilated, the blood pressure may be very low without producing serious damage if, by increasing the percentage of oxygen in the inspired air, adequate oxygen transport to all organs is maintained until replacement of the blood volume by transfusion is carried out.

Ganglionic blocking agents, anti-adrenalin drugs, and vasodilators such as chlorpromazine and its associates can therefore help to safeguard the organism against the harmful effects of shock. By slowing the heart-rate these drugs produce a more efficient cardiac cycle which consumes less energy, and in addition, by lowering the blood pressure, these drugs tend to diminish shock from haemorrhage.

Muscular Relaxation

Muscular relaxation is another common problem in anaesthesia and is nowadays considered to be a *sine qua non* by abdominal surgeons. Twenty years ago the classical method of producing muscular relaxation was by means of deep ether anaesthesia. This produced a depression of the brain-stem, and although the relaxation was adequate by the standards of those days, this was accompanied by vasomotor depression and a general biochemical upset. The most dangerous period with this form of anaesthesia was during the recovery phase when secondary shock was likely to set in and post-operative vomiting was usually taken for granted. With the advent of muscular relaxants this method is no longer necessary and the more rational technique of a light general anaesthetic combined with a muscle-relaxing agent produces conditions which are better for the surgeon and at the same time less harmful to the patient. It is now no longer necessary to depress the vital centres of the brain in order to secure muscular relaxation. A quick and uneventful recovery free from nausea and vomiting is now accepted as the general rule. This is the result of using the agents at our disposal properly; by using a neuro-muscular blocking agent to produce relaxation instead of trying to attain this with an overdose of a central nervous depressant.

It is as well, however, not to forget the implications of the use of muscle relaxants. Although some agents

relax the skeletal muscles in doses which are insufficient to paralyse the diaphragm, this " escape " is only relative and any attempt to use a relaxant without controlling or assisting the respiration will only result in chronic under-ventilation. This condition tends to get worse and not better as the blood CO_2 tension rises. If we accept the fact that when a relaxant is used the respiration must be controlled and CO_2 absorption instituted, we must remember that we are taking over the function of that important chemo-receptor, the respiratory centre. At present we have no accurate method, as this centre has, of performing a minute-to-minute biochemical assay of the plasma alkali reserve; but fortunately the blood buffer system is so efficient that this does not matter over relatively short periods of time, provided the subject is over- rather than under-ventilated. For very long operations of four or five hours' duration, however, this becomes a serious matter as considerable drift of the chemical balance away from normal may produce severe disturbances of the cardiovascular system and the vital centres of the brain. For this reason I think there is a strong case in these long operations for abandoning the use of relaxants in favour of a light general anaesthetic combined with a nerve conduction block.

For abdominal surgery the two most useful forms of regional anaesthesia are the intercostal nerve block and epidural anaesthesia. In the former type, with a little practice, the lower six intercostal nerves can easily be infiltrated as they run along the lower borders of the ribs, the most convenient point being at the angles of the ribs, posteriorly. When infiltrating the 12th dorsal nerve at this point, if the needle is pushed in an extra 3 to 5 mm. the greater splanchnic nerves on each side also become infiltrated. The lower six intercostals carry the sensory and motor nerves for the entire abdominal wall, up to and including the parietal layer of the peritoneum. The splanchnic nerves carry the sensory fibres from most of the viscera, so with this form of anaesthesia complete coverage is obtained for all forms of upper and mid-abdominal surgery. To my mind, the advantages of this type of anaesthetic for a long abdominal operation are so great that they many times outweigh the additional time and trouble which are necessary in the initial stages of the anaesthetic. The result is a very good relaxation, complete indifference of the patient to prolonged traction on viscera, and a smooth post-operative recovery. This latter is probably due, in large measure, to the lack of biochemical disturbance which has taken place. The supporting anaesthesia needs to be only of the lightest; thiopentone, nitrous oxide, and oxygen being all that is necessary. Most forms of nerve block give a fair degree of post-operative analgesia and this, coupled with the rapid return to consciousness, reduces post-operative lung complications to a minimum.

The use of subarachnoid block, or spinal anaesthesia as it is loosely called, has now largely been replaced by epidural anaesthesia or one of the other forms of nerve block already mentioned. This is largely because, in unskilled hands, this technique can give rise to very serious sequelae which in the field of medicine to-day may give rise to litigation. Nevertheless, for certain major types of surgery such as hind-quarter amputation, the coverage given by a good subarachnoid block is very difficult to attain by any other method.

Induced Hypotension

A new technique, which has opened up additional fields to the surgeon, is induced hypotension. By reducing the amount of bleeding from the operation site, the surgeon is afforded better access, and the improved visual field often enables him to perform a better operation. In neurosurgery this technique has rendered many cases operable that have previously been denied the benefit of surgery. Where the intra-cranial tension is very high it is dangerous to open the dura because the extrusion of grey matter which results may cause serious brain damage. By reducing the blood pressure the rate of C.S.F. formation is also reduced, and the resultant fall in intra-cranial tension often renders the lesion accessible.

In view of what I have just said about the mechanism of shock, it is interesting to examine induced hypotension briefly from the physiological standpoint. The methods used to produce this state aim at reducing the blood pressure by diminishing the vasomotor tone without reducing the circulating blood volume. J. Gillies and H. W. C. Griffiths of Edinburgh used total spinal anaesthesia to produce a spinal sympathetic paralysis in the operation of thoraco-lumbar sympathectomy. To do this it was necessary to keep the patient in a steep Trendelenberg position. This is no disadvantage for this operation but it rules out this technique for surgery of the head and neck.

Fortunately the sympathetic ganglia can be blocked chemically by the Hexamethonium series and also by Arfonad*. This latter also produces a peripheral vasodilatation. By injecting one of these agents intravenously it is possible to exercise a measure of control over the blood pressure. This control is enhanced by posturing the patient with the operation site in the highest position so that gravity causes blood to drain away into the dependant parts of the body. Because of the absence of sympathetic tone the compensatory mechanisms which would come into play if the fall in blood pressure was due to shock, do not occur. Vasoconstriction in vital organs of the body which might cause a harmful ischaemia, does not occur unless there is also a fairly severe loss of blood. For this reason, it is important when using this technique to commence the hypotension at the beginning of the operation, otherwise a considerable blood loss may occur before this can be controlled. Providing the cardiovascular system is reasonably healthy and the blood volume remains adequate, the hypotension can readily be reversed by giving a vasopressor such as methyl amphetamine†.

It cannot be denied that this technique constitutes an added risk to the patient, but if each case is examined it is often found that the advantages to the patient in terms of less surgical trauma, a shorter operation and less post-operative oedema more than

* (+)-3,-4.(1', 3'-dibenzyl-2'-keto-imidazolido)-1, 2-trimethylene thiophanium-d-camphorsulphonate.
† Methedrine.

outweigh the risk of cardiovascular accidents, which in a large series of neurosurgical cases has been almost nil. If the anaesthetist cannot satisfy himself that the patient will benefit from the use of hypotension this should not be employed.

Posture

Since the introduction of induced hypotension, the importance of posture in producing a dry operating field has become more generally recognised. Providing this is exploited to its fullest extent, there is often no need to use a sympathetic blocking agent at all. By the careful positioning of the patient, venous bleeding can often be reduced to zero, and as this type of haemorrhage is often more difficult to control than arterial, posture can be a most important factor. This becomes abundantly clear in the operation of spinal laminectomy. If the patient is face-downwards on the operating table and nothing is done to take the weight off the abdomen, the pressure from this region is transmitted via the inferior vena cava and the lumbar veins to the extra-dural plexus. This becomes so engorged that it may be impossible to proceed because of uncontrollable bleeding. This can be avoided almost completely by supporting the patient with the abdomen perfectly free. If this is not done and hexamethonium is given in an attempt to reduce bleeding, the sympathetic paralysis together with venous back-pressure produces an even worse degree of congestion.

The assessment of the fitness of a case for hypotensive techniques is too big a subject to be dealt with here, but I would like to reiterate a special warning against the use of this technique in cases of aortic incompetence. The danger of precipitating acute myocardial ischaemia nearly always makes this method unjustifiable in such cases.

Post-operative bleeding can be a problem after the use of hypotension if special care is not exercised to ensure that the field is completely dry before closing up. The decision whether or not to leave the blood-pressure down for some hours after the end of the operation must be made in each individual case on its merits.

Although it is sometimes the practice to use controlled respiration with induced hypotension, if the blood-pressure is allowed to fall to a very low level the character of the respiration can be a very important index of the efficiency of the cerebral circulation. One of the first signs of brain-stem ischaemia is a deepening of the breathing which often assumes a gasping character. If this condition occurred during the use of controlled respiration this vital sign of impending disaster would not be available.

I am afraid this is a very sketchy outline of the physiology of modern anaesthesia, but it is clearly impossible to cover the whole subject in the time available. I have tried to pick out the more important and controversial points, and these, I think, are common to both our fields.

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Epidural Anaesthesia

BY
JOAN O. JOSHUA
Finchley

Introduction

I HAVE been using epidural anaesthesia in many surgical cases for well over a year, and although I have some views to put before you, I am not certain that my opinions are finally crystallised as yet.

I would emphasise that I did not explore the use of this method of anaesthesia because I was in any way dissatisfied with the methods already available, but simply because, once it became legal for all uses, I felt I ought to make myself familiar with the technique in case I really needed it at any time. Hence I would ask you to believe that any enthusiasm I may show for the method is that of a convert and not that of a previously convinced disciple.

Numbers and Types of Case

I have now used this method in from 60 to 70 cases, and I must say at once that in *no* case in this series have any untoward sequelae resulted so far as the spinal nerves are concerned, *i.e.* there has been no sign of nerve damage (paralysis, etc.), nor of infection.

During the period under review I have failed to induce epidural anaesthesia in some dozen or so cases, in other words, I have obtained nerve block in about 80 per cent. of all cases on which it has been attempted.

The sizes of patients have ranged from a 5 lb. Chihuahua to a 90 lb. Curly-coated Retriever and a 100 lb. Bulldog. Ages have varied from three and a half months to about 12 years.

Local Anaesthetic Solutions

I have worked throughout with lignocain hydrochloride* and I now routinely use a 1 per cent. lignocain hydrochloride with 1:100,000 adrenalin. I have used it as a 2 per cent. solution and have also used it without adrenalin. In a moment of mental aberration I injected 5 c.c. of 2 per cent. lignocain hydrochloride into an 8 lb. Pekingese, missed the site with the first injection and repeated with the same overdose, this time getting into the epidural space. The dog indulged in mild convulsions for about an hour but otherwise showed no immediate ill effects. With the 1 per cent. solution I have had no such incident even with occasional necessity to re-inject, except that very recently I chose to ignore the return of blood from my needle and hence gave 8 c.c. 1 per cent. lignocain hydrochloride intravenously to a 42 lb. Spaniel; she at once had a convulsion but this lasted only a matter of seconds and was not repeated! She has made a complete and uneventful recovery.

* Xylocaine (Duncan, Flockhart).

Needles

These vary from a 1 inch by 20 B.W.G. for dogs up to about 10 lb., to a 3½ inch by 1 mm. for dogs over about 50 lb. The most used length is a 2-inch needle of about 18 B.W.G. for the majority of dogs in the middle-weight range.

Pre-narcosis

On humane grounds I feel that all dogs to be subjected to epidural anaesthesia should be narcotised, and accordingly all patients are given thiambutene intravenously, subcutaneously, or intramuscularly as indicated; morphine is used very occasionally.

One of the most interesting features of this method, to me, has been the way in which spinal block immediately enhances the most restless narcosis in that the dog relaxes so completely that it appears to be under the influence of a general anaesthetic; this is invariable and I can only assume is due to abolition of lower spinal reflexes. Should it be desirable after the operation the action of thiambutene can be antagonised by analorphine and it is interesting to note that no dog has been in the least worried about its "absent" hindquarters on becoming fully conscious.

The only patients to show any discomfort during attempted epidural injection have been those in which a peritonitis was already present at the time of attempted surgery. No local infiltration of the skin over the site has been necessary.

Technique

The site of the injection is the lumbo-sacral articulation and the method is well described in Wright's *Veterinary Anaesthesia*. I have found that the landmark of most value is the spinous process at the last lumbar vertebra, which can often be located in quite muscular and obese animals in which the external angles of the ilium cannot be palpated accurately. I have the dog restrained on its sternum, with the hind legs flexed under the animal and if necessary drawn slightly forward to flex the croup; it is important that the dog should be held as level as possible so that the midline can be accurately assessed. The needle is inserted in a downward and slightly backward direction immediately behind the spinous process, and in the majority of cases the needle will be felt to touch bone; I find I do not normally get into the neural canal direct, it usually requires slight adjustment of direction more posteriorly when the needle will travel a further ½ to 1 cm. according to the size of the dog, and then touch bone again—this should be the floor of the neural canal. I have only rarely obtained the popping sensation on puncturing the inter-arcual ligament as is described. In some 20 to 30 per cent. of cases the tail gives a distinct twitch when the epidural space is entered; we find this sign 100 per cent. reliable as to being in the right place. I find resistance to injection of the anaesthetic solution unreliable, as I have often been able to inject with no resistance and yet am not in the neural canal.

In cases of difficulty the position of the dog is altered from full flexion of the spine to normal extension. Each case must be treated on its merits.

Great difficulty can be encountered in large dogs which are either fat or have the spine and quarters well clothed in heavy muscle. Smaller fat or heavily muscled dogs do not present so much difficulty. The large dog is always something of a problem, as it is far from easy to manoeuvre the far end of a 3½-inch needle through dense tissue. Curiously enough the Cocker Spaniel, even when lean and not too big, frequently defeats me—I do not yet know why.

I have recently been informed that in some dogs the foramen between the last lumbar vertebra and the sacrum is absent. This would explain the difficulty and in such cases the neural canal can sometimes be entered between the last two lumbar vertebrae.

Anaesthesia supervenes in some one to two minutes, indicated by flaccidity of tail, relaxation of abdominal muscles, and later by loss of anal reflex (very reliable) and pedal reflex (less reliable as it is already weakened by narcosis). The peaceful deepening of narcosis is also a good guide.

Dose

This varies from 1.5 c.c. in the 5 lb. Chihuahua to 11 c.c. in our largest patients. I try to assess the calibre of the neural canal from the general bone structure of the dog and gauge the dose accordingly. I have had *no* trouble with possible over-dosage affecting respiration, not even in the 8 lb. Peke to which I gave 5 c.c. (enough for a 20 lb. dog!). Neither do we turn them on their backs; after I am satisfied epidural anaesthesia is present they are put into lateral recumbency to be prepared for operation. If overdosage is feared the forehand of the dog can be raised during operation—I have done it once or twice but doubt if it has been necessary.

Types of Operation

Every type of operation posterior to the umbilicus can be performed under epidural. In my series about half the cases are ovaro-hysterectomies, the vast majority for pyometra; next in number have been caesareans, then various types of orthopaedic surgery of the hind limbs, the remainder including enterotomies, cystotomies, hernias, and a variety of others, such as castrations, inguinal and abdominal castration, anal adenomata, etc.

Deaths

This series includes eight deaths from all causes following operation. I have to ask you to bear in mind that the series under review includes cases from several other practices, hence there are some exceedingly bad surgical risks from a variety of causes, as I have not had the opportunity of assessing the state of health as is possible in one's own cases.

The fatalities were as follows:—

1. Crossbred Scottie, 11½ years old, pyometra, died 11 days later—cardiac failure.

2. Peke, pyometra, exceedingly toxic, overdosed, died four days, p.op.; heart attack.

3. Mongrel, pyometra, v. obese, delayed diagnosis and exceedingly toxic.

4 Mongrel, caesarean, v. toxic, later found to have been in labour 72 hours. Died shortly after epidural induced.

5. Peke, pyometra, dog weighed 8 lb., uterus 2 lb., fall in B.P. due to abd. overdistension, caused respiratory failure.

6. Mongrel, pyometra, sudden v. acute onset, coincidental peritonitis. As case 4, died shortly after induction of epidural.

7. Poodle, enterotomy, rubber foreign body in gut (perforated) seven days. Died 24 hours later.

8. Bulldog. pyometra, v. toxic, emaciated, extreme anaemia. Died four days p.op. of pulmonary congestion.

In no case can I attribute death solely to the method of anaesthesia, in fact in several the patients were such poor risks that their survival during operation was virtually an anaesthetic triumph.

The fall in blood pressure, in my view, precipitated final collapse in the two cases already showing peritonitis. This fall in blood pressure also slightly enhances surgical shock in very toxic dogs; the rectal temperature remains subnormal for about 48 to 72 hours post-operatively in many cases.

Gross over-distension of the abdomen as in the one pyometra cited, or in excessively heavy gravid caesars is a *contra-indication* for spinal anaesthesia in my view. The sudden reduction of abdominal pressure, and the fall in blood pressure, has proved fatal in one of my cases and one caesarean of which I have knowledge. I have so far not seen any way to overcome this.

This is the *only* disadvantage of the method I can find.

Advantages

The dog is never under general anaesthesia, and thus, once epidural anaesthesia has been established for about five minutes there is no need to watch the patient's respiration, except in the gross overdistensions already mentioned. In short-faced breeds all respiratory worries are abolished. Anaesthesia of the surgical field is absolute—there is no question of depth. Muscle relaxation has to be seen to be believed, thus eliminating all need for muscle relaxants and any form of respirator; it is literally paradise for orthopaedic surgery. There is no "popping" of gut, nor straining when dealing with the cervix in pyometra. Recovery is *always* quiet and can be hastened with analorphine if desired. Foetuses in caesarean are so lively they almost crawl out of the uterus.

Conclusions

My reaction to epidural anaesthesia after this experience so far, is that I now feel aggrieved when operating anterior to the umbilicus because I cannot use epidural anaesthesia; and in those cases where, for some of the reasons mentioned, I have either failed to obtain or have not used epidural, I realise how spoiled I have become by this method and spend my time complaining of incomplete relaxation, when previously I would have felt quite satisfied.

I can only say to you, "Try it and See!"

Ringworm in Cattle : an Account of an Outbreak

BY

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Introduction

RINGWORM of cattle was recorded in the earliest accounts of disease in domesticated animals. Although accurate records of the incidence of the condition throughout this country are not available, it is generally known to occur commonly in young cattle, and to be especially prevalent during the winter months, spontaneous recovery often occurring when the animals are turned out to grass in the spring.

Due to the benign nature of the disease few outbreaks of ringworm are brought to the notice of veterinary surgeons, and when they are there is rarely an opportunity to investigate the outbreak in detail.

The present outbreak is recorded because of this paucity of information on the epidemiology of cattle ringworm.

The characteristic circular, scaly, hairless lesion is caused by the infection of the hairs, hair follicles, and epidermis with the fungus *Trichophyton verrucosum* var. *discoides* although there are records of infection with *Trichophyton mentagrophytes* (Ainsworth & Austwick, 1955).

Although emaciation may occur in some young calves with lesions over large areas of the body, serious ill effects are not usual and in spite of the possible transference of infection to man, many stock owners pay little attention to the existence of ringworm in their animals.

Because of this risk of human infection from animals there has, in recent years, been a renewed interest in the animal mycoses, and Ainsworth & Austwick (1955) during the course of their survey examined material from 71 suspected outbreaks and isolated *T. verrucosum* var. *discoides* from 41 of these samples. These positive isolates were distributed throughout the year and this might suggest that the idea of a seasonal incidence in the winter months was not necessarily correct. On the other hand most typical ringworm outbreaks are diagnosed on the naked-eye appearance of the lesions and it is reasonable to suppose that the material submitted for laboratory examination was selected because the lesions were atypical in appearance or occurred at a time of the year when ringworm was not usually expected.

Description of the Outbreak

The disease commenced during the month of June amongst a group of 30 shorthorn heifers and bullocks aged six months to one year (Group A). They were separated from a similar group of 33 animals (Group B) by a wooden fence but both groups were isolated from the main farm stock by arable fields and woodland. About six weeks before the first lesions were seen a batch of 18 heifers had been bought and formed Group A together with 12 home-bred animals. It was

in these purchased animals that the first three affected cattle were discovered. Two weeks later the first lesions were seen in home-bred animals of Group A. The disease spread rapidly through Group A and four weeks after the commencement of the outbreaks the first lesions were seen in Group B. Six weeks later, *i.e.* 10 weeks after the first case, all 63 of the animals in both groups were, or had been, affected.

It should be mentioned that there was probably a greater degree of contact between these animals than would occur in a similar group of cattle at grass on the average farm. At approximately three-weekly intervals the cattle were gathered for bleeding. For this purpose they were collected in a small wooden fenced pen and driven through a metal-framed wooden sided crush. As soon as the disease was seen to be spreading through the cattle, steps were taken to wash and disinfect the crush after each use. In addition a weekly examination was instituted at which new lesions were noted and treatment was carried out by the application to all lesions of a proprietary dressing containing phenyl mercuric acetate. The dressing was applied directly to the lesions without previous removal of crusts. With the passage of time new cases appeared and other cases recovered, but it was not until 30 weeks after the initiation of the outbreak that the last lesions disappeared.

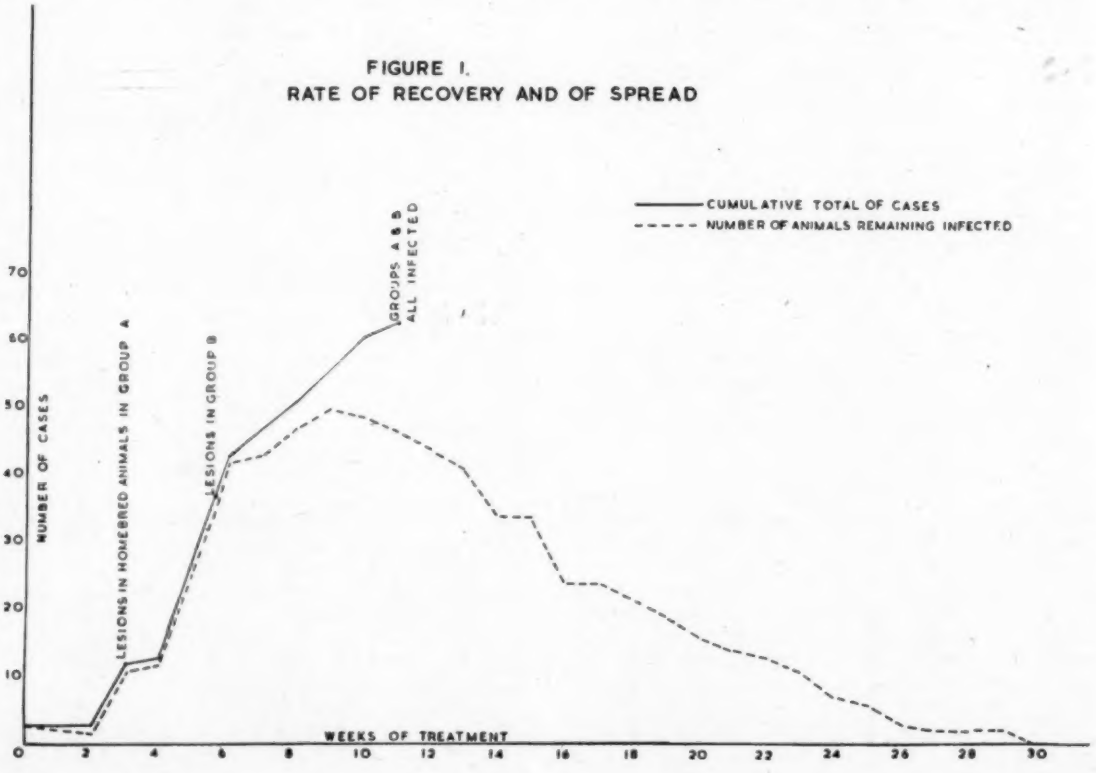
There was a slight extension of the disease when a milk-fed calf at the main farm buildings developed a circular lesion in the mid lumbar region. This animal was fed by an attendant who had handled the two groups of infected heifers and bullocks. *T. verrucosum* var. *discoides* was isolated from the lesion and daily treatment was commenced with the same dressing as had been used on the main outbreak. The lesion disappeared in four weeks and no further spread occurred in spite of the fact that about 20 other calves in the same shed (Group C) were separated from the affected animal only by open tubular divisions.

T. verrucosum var. *discoides* had also been isolated from several of the early cases in Groups A and B but hairs gathered from the woodwork of the crush and the wooden field fences were negative on culture.

As the disease subsided in Groups A and B the recovered animals were segregated and a group of nine of these cattle was sold 18 weeks after the commencement of the outbreak. Thirteen weeks later, *i.e.* 31 weeks after the first cases had been detected, the last lesions had disappeared and 20 of the remaining animals were housed in one side of a covered yard. In the other half of this yard, separated only by a tubular iron fence, were placed the 21 younger cattle (Group C) mentioned in the previous paragraph.

Soon afterwards ringworm lesions were noticed in one of the cured animals from Groups A and B and also in Group C; and a total of 17 cattle were affected, *T. verrucosum* var. *discoides* being isolated from the lesions. The single animal was moved in with Group C and treatment was again instituted. In addition the opportunity was taken to make a comparison between two methods of treatment, one being the

FIGURE 1.
RATE OF RECOVERY AND OF SPREAD



twice-weekly application of the phenyl mercuric acetate dressing employed in the initial outbreak, and the other being a weekly intravenous injection of sodium iodide in 33 per cent. w/v solution at a rate of 3 grammes per cwt. of bodyweight. The treatments were applied to alternate animals as they came through the crush, eight were treated with ointment and nine with intravenous sodium iodide.

During this time the pens in the calf house originally occupied by Group C in the main buildings were being filled up with young calves either born on the farm or bought in from three different sources. Two of these purchased calves, 8 and 11 weeks after arrival, developed ringworm lesions from which *T. verrucosum* var. *discoides* was isolated. Daily dressing with the phenyl mercuric acetate ointment was instituted and recovery was complete in five weeks and 11 weeks. Again the disease did not spread to calves in adjacent pens separated only by tubular iron divisions.

Results

Details of the outbreak are summarised in the accompanying diagrams. Figure 1 gives the rate of appearance of infected cases and the number of infected cases throughout the outbreak. Figure 2 shows the duration of lesions on each animal. In view of the fact that examinations were carried out at weekly intervals there is a possible error of almost two weeks in this information. Figure 3 gives the frequency of lesions on different parts of the body. Figures 1 to 3 are concerned with the initial outbreak in Groups A and B. The results of the two treatments in the secondary outbreak in Group C are given in Figure 4.

Discussion

The current clinical impression of cattle ringworm is that outbreaks are common in the winter and rapid spread occurs due to close contact amongst housed animals, whilst in animals at grass spread is rare and spontaneous cure is the rule. The interim results of a current survey of the incidence of cattle ringworm in the Eastern counties confirm this impression (Mortimer, 1956, unpublished).

On the contrary here was a serious outbreak which occurred in the summer months and rapidly spread until all of 63 animals were affected, whilst a second outbreak during winter extended to only 17 of 20 cattle. Treatment was carried out in both outbreaks; in the summer outbreak the mean persistence of lesions was 17 weeks and in the winter 10 weeks. In neither case were untreated controls kept so it was not possible to say whether treatment shortened the course of the infection or not. Both Figures 1 and 4 show that in Groups A and B and in Group C there was a period of five or six weeks between the occurrence of the first lesions and the first recoveries. In view of the well-known spontaneous disappearance of lesions from grazing cattle and the persistence of lesions in the present cases it is unlikely that treatment affected the course of the disease, and even if there was a slight curative effect the labour involved in the collection and treatment would make it an uneconomic procedure in ordinary farming practice. Undoubtedly the weekly herding together of grazing animals would increase the possibility of transference of infection from animal to animal and there would need to be a pronounced curative effect to justify this increased risk of spread.

In Group C there was no significant difference between the rates of cure under the two different treatments, and in Groups A and B there was no relation between the duration of disease and the number of lesions in individual animals.

It is a common belief that whilst direct spread from animal to animal undoubtedly occurs, spores are also picked up by animals when rubbing on parts of buildings and particularly from fences, tree stumps, and other places where animals congregate and rub. A number of samples of hair and scrapings were taken from fence posts and tree trunks but no pathogenic fungi were obtained on culture. Recently Walker (1955) has shown that *T. verrucosum* var. *discoides* may be recovered from material of this nature.

Ringworm is generally regarded as being highly infectious and whilst the rate of spread through Groups A and B illustrates this point yet there are three other instances in the present series of events where equally rapid spread was expected but did not occur. As previously mentioned, a lesion developed in a single calf of Group C whilst these animals were

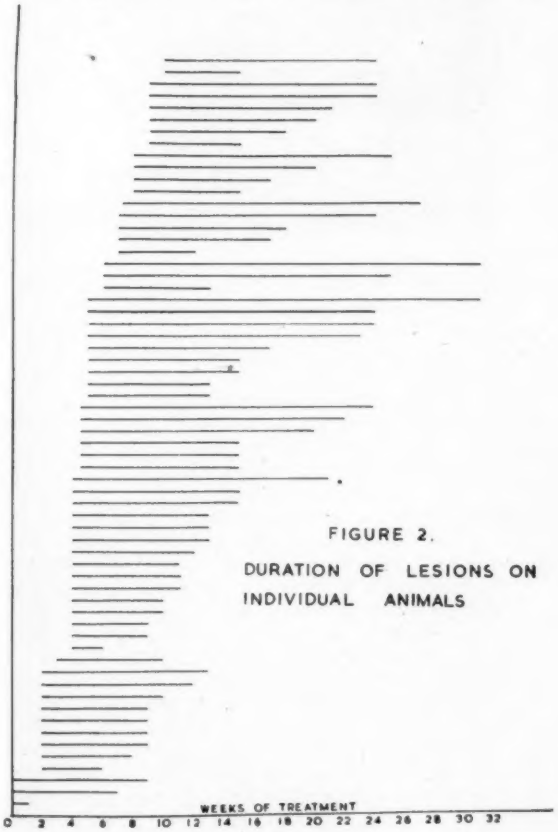


FIGURE 2.

DURATION OF LESIONS ON INDIVIDUAL ANIMALS

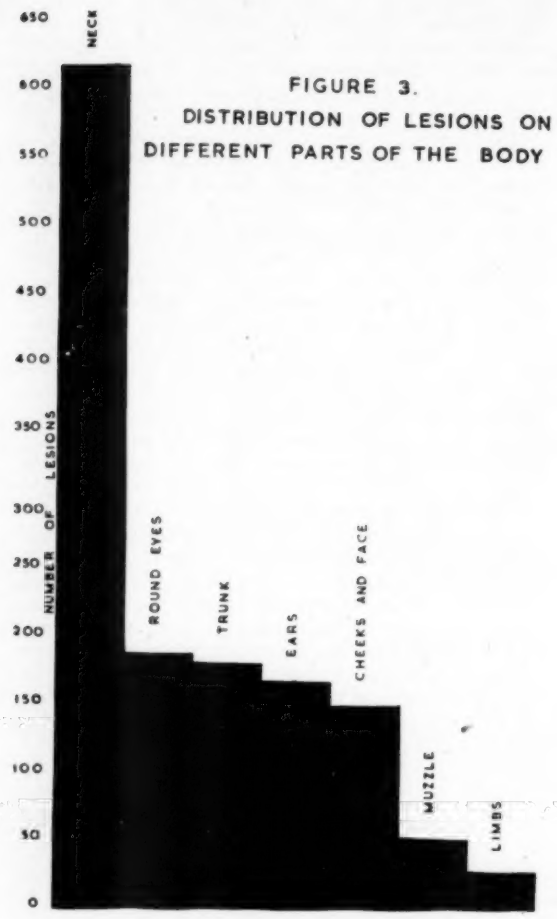


FIGURE 3.
DISTRIBUTION OF LESIONS ON DIFFERENT PARTS OF THE BODY

in the calf pens at the main farm buildings about half a mile from Groups A and B, and later when Group C had been moved to the covered yard, two more cases appeared simultaneously in purchased calves in the calf pens at the farm. None of these cases spread to calves in adjacent pens through the tubular iron divisions. It is difficult to give a reason for this failure to spread amongst what must have been a susceptible population unless it is suggested either that daily fungicidal treatment produced such a rapid sterilisation of the lesions that spread was prevented, or that the effect was a mechanical one in that the daily smearing of lesions greatly reduced the aerial disseminations of spores.

The other striking failure of the disease to disseminate was when cases appeared in Group C but only in one of the remainder of Groups A and B separated from Group C by a tubular iron fence. It was not possible to be certain whether this single case was a reinfection or a recrudescence of an apparently healed lesion but in any case the freedom of the remainder of Groups A and B from infection in the presence of lesions on 16 out of 20 animals of Group C in the other half of the yard was notable. Hoerlin (1945) and Sellers, Sinclair & La Touche (1956) have shown, in a total of three experimental animals, that a resistance to reinfection can occur and the experience here suggests that recovery from natural infection also confers a marked degree of resistance to reinfection.

Mention should also be made of the fact that whilst at least nine people were in close contact with the infected cattle no cases of human infection occurred. On the other hand, contact was not as frequent as it would have been if all the cattle had been housed and hand-fed.

It was possible to observe the happenings in this particular outbreak of cattle ringworm more closely than is usually the case and in some respects the findings differed from those generally encountered. The events underline the need for controlled trials to establish a treatment effective under field conditions and further investigation of the possibility that recovered cases possess some resistance to reinfection.

Acknowledgments.—I am grateful to Mr. P. H. Mortimer, M.A., B.V.SC., M.R.C.V.S., for undertaking the cultural examination of material, and to Miss L. A. Liddell, N.D.D.H., for careful recording of results.

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PNEUMONIA IN SHEEP

The prevalence of pneumonia in sheep was one of the subjects dealt with by Mr. A. Stevens, of the Ministry of Agriculture's Veterinary Investigation Centre, Cambridge, when he spoke to Northumberland farmers at Hexham on November 8th.

The disease, he pointed out, could be caused by a variety of organisms, but the one he had most in mind was associated with *Pasteurella*. Recently, at Cambridge, they had managed to isolate a second organism—a smaller one—which might play a part in causation of the disease, but there were probably management factors as well. For instance, they never saw the disease in hill ewes except when the ewes had been gathered together abnormally in transport vehicles or brought down in the winter months to be hand-fed.

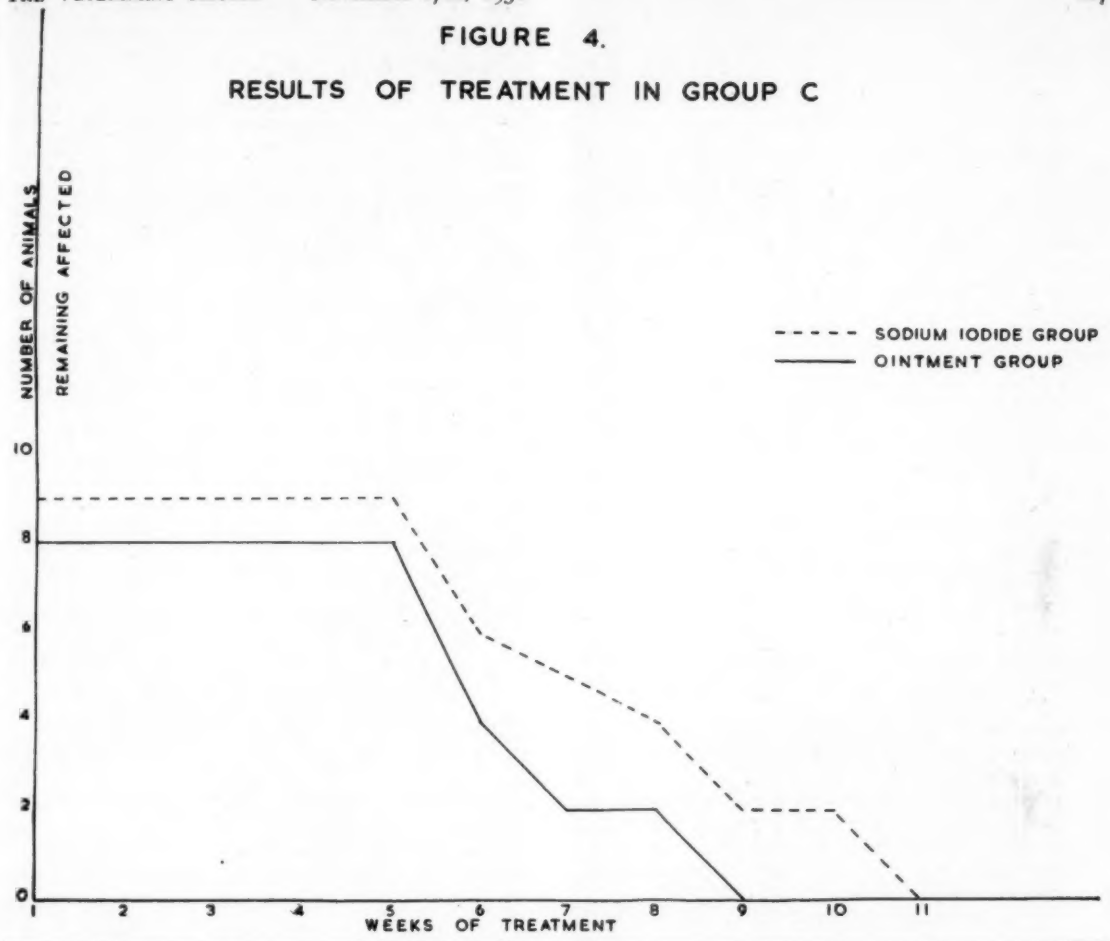
At the moment the best advice they could give farmers and shepherds was to avoid, as far as possible, subjecting the sheep to overheating and overcrowding.

RICHMOND HORSE SHOW

Mr. T. A. Dobie, M.R.C.V.S., who was appointed to the Board of Directors of Richmond Royal Horse Show in 1951, was elected Chairman of the Show for 1956-7 at the Annual General Meeting on October 30th.

FIGURE 4.

RESULTS OF TREATMENT IN GROUP C



MEAT INSPECTION IN MANCHESTER

An anomalous situation between the markets and the health departments of the Manchester Corporation is dealt with in a report by the General and Parliamentary Committee, submitted to the City Council on November 7th. It states:—

"Whilst the Markets Committee are responsible for the administration of the Slaughter of Animals Act, 1933, neither the chief officer of the committee nor any of their veterinary officers is entitled to inspect premises for the purpose of ensuring that the Act is complied with; the committee employ sanitary inspectors for the purpose, but those inspectors are not subject (as by law they should be) to the general direction of the medical officer.

"Under the present arrangements, the position of the Medical Officer of Health is a peculiar one. In Manchester, he is not at present permitted to carry out his statutory functions in view of the allocation of work to various committees; this is most undesirable. Two examples may be quoted:—

"(a) The Medical Officer of Health is prevented from seizing unsound food although the Act authorises him to do so, but the committee arrangements cannot prevent him from exercising his statutory duty to seize food which is causing, or is likely to cause food poisoning.

"(b) The Slaughter of Animals Act, 1933, expressly empowers the Medical Officer of Health to exercise functions in relation to the humane slaughtering of animals, but these functions are exercised by the markets committee through sanitary inspectors employed in the markets department, notwithstanding the fact that neither the veterinary surgeons nor the general manager have any statutory responsibility for any such work performed by the inspectors. These instances give further emphasis to the confusion and inconsistency of the present arrangements."

It is now proposed that the Health Committee shall exercise the following powers and functions: regulation and inspection of private slaughter-houses and knackers yards and the slaughter of animals; examination and seizure of unsound food, and the inspection of food premises (but not the provision of wharves for landing imported animals). It is intended that the functions of the Markets Committee shall be limited to the management and administration of the various city markets undertakings.

News and Comment

JURY SERVICE

The Registrar of the Royal College of Veterinary Surgeons would remind all veterinary surgeons and supplementary veterinary practitioners practising in the United Kingdom that this is the time of year to obtain exemption from jury service.

It must be emphasised that exemption from jury service is not automatic.

Liability to jury service depends upon inclusion in the local jury book which is compiled each year from the Electoral Registers. On these Registers the names of all persons who are, on October 10th in each year, qualified and liable to serve as jurors are marked with the letter " J."

Members have probably filled up a form recently asking them to give the names of all occupants of their households who are eligible to vote. During the period November 28th to December 12th, 1956, the lists compiled after the return of these forms will be displayed in town halls, post offices, and other public places. They may there be inspected, and if the letter " J " is marked against a member's name and he wishes to obtain exemption from jury service, he must write to the Electoral Registration Officer for his area and point out to him *not later than December 12th* that he is exempt.

The authority which should be quoted in the letter is Section 24 of the Veterinary Surgeons Act, 1948, which reads:—

" (1) No member of the Royal College of Veterinary Surgeons, and no person for the time being registered in the Supplementary Veterinary Register, shall if actually practising veterinary surgery be liable to serve on any jury."

" (2) This section shall not extend to Northern Ireland."

ANIMAL HEALTH TRUST CONFERENCE AT NORWICH

Diseases of pigs, sheep, and cattle were discussed at a conference in Norwich last Saturday arranged by Norfolk branch of the Animal Health Trust. The speakers were Dr. K. C. Sellers, director of the Trust's Farm Live-stock Research Station at Stock, and Mr. A. L. Ogden, senior research Fellow at the Station.

Dr. Sellers, speaking on disease losses in pigs, said that farmers should make full use of crystal violet and other vaccines, not only in their own interests but to help prevent the spread of disease in the country as a whole.

Investigations had shown that between 15 and 20 per cent. of all pigs born died before weaning. The majority of these losses occurred during the first few days. A high incidence of still births usually meant that sows had suffered from some acute illness during pregnancy, and research had indicated that lack of vitamin A might be a factor. From his own experience in the field he believed that this trouble was less common where sows had been on pasture during pregnancy.

Antibiotics could be a great help in the treatment of diseases that appeared soon after farrowing. Field work was being carried out at Stock on underlying factors in these conditions. It seemed that these diseases were found more frequently in sows and gilts that had been kept indoors during pregnancy and in over-fat animals, although he would not like to be dogmatic on the latter point.

Discussing disease problems in breeding ewes, Dr. Sellers said the Trust's latest survey, made in Yorkshire and completed last year, showed that out of every 100 ewes that went to the tup, 15 did not produce a lamb. Barrenness, which was much more common in hill than in lowland flocks, was to a large extent a result of bad management.

A high proportion of deaths in the first two months of pregnancy were due to pulpy kidney disease. Preliminary investigations had shown that two doses of the modern treatment would protect the ewe from this condition during pregnancy and that she would pass on to her lamb immunity that would last for the first six weeks.

With sheep, prompt diagnosis of disease was more important than in any other animal. In reply to a question, he said ragwort was as harmful to sheep as to cattle. In his experience sheep would avoid this plant in the field. The great danger from ragwort was when it was cut with hay, since in the dried state the animal could not easily distinguish it from the other herbage.

Mr. Ogden, reviewing the problem of bovine infertility, said a striking feature was the enormous variation in the incidence of this trouble between herds. The average figure for first service conceptions was between 60 and 65 per cent. There was evidence that fertility within all herds varied from year to year and seldom stayed in the low category for more than two years in succession and in most cases for not more than one year. Attempts were now being made to ascertain what correlation there was between management and other factors and infertility.

A Milk Marketing Board survey had shown that the conception rate in the Eastern and South-eastern counties was 5 to 8 per cent. lower than in the northern and western parts of the country. Factors associated with the problem were being studied at Stock, and a random sample of some 150 herds covering the area of the Beccles cattle-breeding centre and its sub-stations was being taken for this purpose. The sample included herds of all sizes and categories and was not confined to those in which A.I. was used. The number of animals involved approached 5,000. By this study they were hoping to get an indication of the normal levels of infection in dairy herds and to ascertain whether some of the organisms were as detrimental to breeding as had been supposed in the past. They were also interested in the problem of animals, which, after apparently getting into calf, returned to heat.

Asked if there was any connexion between high yield and fertility, Mr. Ogden said this point had been investigated by a number of workers and all the

evidence went to show that if an animal was fed according to what she was producing, her breeding potentialities were not affected.

ELECTION OF MEMBERS TO THE COUNCIL R.C.V.S.

In accordance with the provisions of the Veterinary Surgeons Act, 1948, five members of the Council, who must be members of the Royal College, will be elected in 1957 by members of the Royal College residing outside the Republic of Ireland.

Five present members of Council will retire at the Annual General Meeting in 1957 and are eligible for re-election, namely:—

L. G. Anderson, Esq., Professor R. Lovell, T. M. Mitchell, Esq., R. F. Montgomerie, Esq., and Professor L. P. Pugh.

Nominations of persons for election to the Council must be submitted in writing on a form which may be obtained from the Registrar, and which must be returned to him duly completed before January 31st, 1957.

Each nomination form must bear the signature of the proposer and seconder, who must not be present members of Council, and must be counter-signed by the nominee.

MILK PASTEURISED IN BOTTLE

Reference to the successful practice of " in bottle " pasteurisation on the Derbyshire farm of the Hon. J. W. Hives, is made by Dr. J. B. S. Morgan, Medical Officer of Health for the county, in his annual report for 1955 published on November 8th.

Dr. Morgan states that the plant operated by Mr. Hives is notable in that the raw milk is bottled and capped before pasteurisation, as opposed to the usual method of pasteurisation in bulk, followed by the bottling and capping process.

The results of the methylene blue tests are described as being worthy of special mention.

Three samples taken in March went 19 days before failing the test, three taken in April lasted eight days, and one in June lasted six days. A July sample, taken during very warm weather, failed the test on the third day. These results confirmed that one of the features of milk processed " in bottle " was its keeping quality.

In practice, the plant has been very successfully operated, Dr. Morgan writes, and sample results, as indicated, have been consistently good. " It is felt that a plant of this type has considerable merit from the point of view of the small processor, faced as he is with serious labour difficulties, but whether there are many dairymen prepared to embark on pasteurisation to-day is open to question. It seems that this type of plant is likely to become popular in overseas markets."

THE R.V.C. COMMEMORATION BALL

The Principal of the Royal Veterinary College, Mr. R. E. Glover, and Mrs. Glover, were present as guests of honour at this year's Commemoration Ball, which was held in the Great Hall of the College on Friday, November 9th. Other guests of note included Emeritus Professor G. H. Wooldridge, Professor J. McCunn and Mrs. McCunn, Mr. H. W. J. Adams (Bursar) and Mrs. Adams.

Decorations were again of the highest standard, and a choice of two dance bands and two bars was offered to the 150 couples present. Dancing continued until 2 a.m.

Left to Right. Emeritus Professor G. H. Wooldridge, Miss Faith Jackson (President of the Women's Union), Mr. and Mrs. R. E. Glover and Mr. J. Hughes (President of the Students' Union) at the R.V.C. Commemoration Ball.

R.C.V.S. EXAMINATIONS

Pharmacology Examination, November, 1956
Dublin

Barrett, J. N.; Berry, J. P.; Corry, D. M. G.; Crawford, H. M.; Delahunty, Daniel; Dowling, W. A. (credit); Duignan, J. J.; Feeney, J. K.; Flannery, Donald; Hannigan, J. H.; Holloway, A. B.; Keane, D. C.; O'Brien, T. J.; O'Donnell, L. I.; O'Reilly, D. J.; Phelan, N. P.; Sweetman, W. L.; Trouton, R. K.; Walsh, John, and Wilson, R. W.

Animal Management Examination, November, 1956
Dublin

Browne, F. J.; Byrne, J. F.; Coad, B. P.; Condon, J. C.; Cooney, M. A.; Corry, Edward; Demery, V. W.; Hassett, J. L.; Hewitt, M. P.; Holloway, A. B.; Keane, D. C.; Lynch, Patrick; McCarthy, William; McDonald, T. O.; McParland, P. J.; Nolan, Vincent; Nyhan, J. F.; Sharpe, Peter; Sherrard, J. C.; Wall, Henry (credit); Walsh, John, and Wilson, R. W.

PURCHASE TAX ON VETERINARY PRODUCTS

A plea for the removal of purchase tax from veterinary products was made at the recent annual meeting of the Cirencester branch of the National Farmers' Union.

In proposing that a resolution should be sent from the meeting urging their London headquarters to press "in the strongest way" for the tax to be removed, Major Mytton Mills commented: "It seems morally wrong that in order to heal animals you should be taxed."

The proposal was adopted unanimously.

AWARD FOR POULTRY RESEARCH

On November 8th, in London, the Rt. Hon. Tom Williams, M.P., presented, before a distinguished gathering, a bronze medal and parchment to Dr. R. F. Gordon. This was awarded by the Poultry Association of Great Britain which gives each year not more than three Awards for long and distinguished service to the United Kingdom poultry industry. Dr. Gordon was cited as having won the award for his services in the field of poultry research.

MR. H. M. ANDERSON

The sudden death of Mr. H. M. Anderson, the Assistant Secretary and Assistant Registrar of the Royal College of Veterinary Surgeons, on Tuesday, evening, November 6th, was briefly mentioned in our last issue.

Harold Mead Anderson was born on May 22nd, 1922, and as a child lived for a while in Switzerland, where his father had retired. His facility in the German language came from the period spent at the Swiss German School in Locarno. Subsequently, after attending preparatory school in England, he proceeded to Haileybury, and thence to Oriel College, Oxford, where he read Modern Greats, gaining distinction in International Relations. He graduated B.A. in December, 1943.

Thereafter, until July, 1946, like so many other young men of his generation, he was caught up by the war. After a short initial period in the ranks he was commissioned as a Sub-Lieutenant in the R.N.V.R., being subsequently promoted to Lieutenant by accelerated promotion. He served in the Naval Intelligence Division, attached to the Foreign Office at Bletchley.

Then followed appointment to the Colonial Administrative Service, where he served in Benin, Nigeria, until April of 1948, when he was invalided out of the service. It is a measure of the rigid attention which he gave to his work at all times that his health gave way under the great strain of concentrated and conscientious work in a tropical climate.

After a short rest on a farm taken by his mother in Cornwall, a venture which proved unsuccessful but was the source of knowledge for him in his work at the College, he became an Administrative Assistant to the Registrar of the University of Manchester, and later Secretary to the Faculty of Arts in that University. His work there lay in that field which was always his strongest point, namely of the issue of publications and in the basic administrative work of an academic body.

There he met his wife, who was on the secretarial staff of the University, and his two young sons were born whilst at Manchester.

His appointment to the new position of Assistant Secretary and Assistant Registrar at the Royal College of Veterinary Surgeons, which commenced on May 1st 1954, was from a list of 395 applications for the post.

At the College his quiet devotion to his work and to detail was much appreciated by the members of the Council who came into contact with him and by the staff at the College. He went out of his way to help those from overseas who needed advice. At home in Wallington his principal interests were an ardent devotion to reviving the Liberal Party and quiet week-ends with his family in a caravan in Sussex.

It had been known for a little time that his heart was in a serious state but so sudden an end was not anticipated. Yet the quiet and peaceful transition from life into death whilst sitting in an arm-chair can be said to be the end that he would have desired.

His funeral on Friday last was entirely private and confined to the immediate family except that Mr. Oates, the Registrar of the College, attended at the personal request of the widow. A short service was held at his home, and, subsequently, at the South London Crematorium there was a brief ceremony at which only his father-in-law and the Registrar were present.

MR. NEIL MATHIESON

The death occurred at the Peace Memorial Hospital, Watford, on November 11th, 1956, of Mr. Neil Mathieson, M.R.C.V.S., of 10, Colne Way, Watford, Herts. Mr. Mathieson was head of the Veterinary Department of Glaxo Laboratories Ltd.

Mr. Mathieson, formerly liaison secretary to the National Veterinary Medical Association of Great Britain and Ireland (now the British Veterinary Association), was born in 1919 at Glasgow, and educated at the High School of Glasgow and Glasgow

Veterinary College. For several years he had two veterinary practices in Lanarkshire, one at Larkhall and the other at Motherwell. He was a past president of the Glasgow Veterinary Medical Association. He relinquished both practices when he moved south. During the war Mr. Mathieson worked for the Ministry of Agriculture on problems associated with foot-and-mouth disease.

A prominent Scottish Nationalist, he was chosen to contest Kirkcaldy at the General Election in 1950, but owing to illness had to withdraw his candidature.

Mr. Mathieson joined Glaxo Laboratories Ltd. in August, 1951, as a veterinary consultant and became head of a newly-created Veterinary Department. Within a few years Mr. Mathieson had supervised the marketing of a wide range of veterinary products, and had taken part in initiating a far-seeing programme of veterinary research.

He is survived by his wife and daughter, to whom our deep sympathy is expressed.

The funeral took place yesterday (Friday) morning at North Watford cemetery. The profession's representatives included Dr. Tom Hare for the Herts and Beds Division of the B.V.A., and Mr. N. McG. Black. Mr. F. Knight and Mr. L. Fredericks represented the head office of the Association, and there were a number of representatives from the pharmaceutical industry.

L. F. writes:—

I would like, if I may, to pay a tribute to Neil Mathieson, if only for the reason that I have cherished the notion for some years that I was " responsible " for him when first he became concerned with veterinary public relations.

It so happened that I was the only member of the male staff about when he first took up his duties as Public Relations Officer to the Association. With what I felt to be suitable concern for a provincial cousin, I tried to make him at home despite the gloomy Bloomsbury background which was all he had until he was settled.

Ours became a close friendship; and then, one afternoon, I had a telephone call, delivered in that " imperial " fashion which was a hall mark of his rich personality, to say that he had accepted a new appointment with Glaxo Laboratories. It was not, he said, " at a higher salary, " but at " a magnification of salary." The rich Scottish tone in which this *bon mot* was uttered remains with me yet, for his voice was characteristic of that " bigness " which was so essentially part of him. Throughout our friendship it was apparent that " bigness " appealed to him of all things. There was never a man from whom anything petty was further removed.

In the new post he had accepted he saw the possibility of proving the value of the profession in a way completely within his competence. Short as his life was he devoted it wholly to the interests of his profession as all his colleagues at Greenford will testify. Not least among his qualities was that though he enjoyed considerable professional success and esteem, he never forgot friends or less fortunate colleagues, and went out of his way to retain acquaintance with them and share all he had. I know I am only one out of very many who will miss him deeply.

PERSONAL

Births

LAING.—On November 9th, 1956, at the Lady Forester Hospital, Much Wenlock, Shropshire, to Margaret, wife of A. H. Laing, M.R.C.V.S., two sons, brothers for Roderick.

PFOB.—On February 5th, 1956, to Moira, wife of Major L. S. Pfob, M.R.C.V.S., D.T.V.M., Provincial Veterinary Office, P.O. Box 433, Jinja, Uganda, a daughter, Lesley, sister for Lorna and Alan.

R.C.V.S. OBITUARY

We record with regret the deaths of the following members of the profession:—

FRANCIS, Frederick, 402, Harrow Road, London, W.9. Graduated London, December 6th, 1940; died November 11th, 1956. The funeral took place at Kensal Green (Catholic) Cemetery. Mr. Francis was veterinary consultant to several clinics run by the Blue Cross.

MATHIESON, Neil Hughes, 10, Colne Way, Watford, Herts. Graduated Glasgow, December 10th, 1942; died November 11th, 1956.

COMING EVENTS

November

22nd (Thurs.). Annual Dance of the Victoria Veterinary Benevolent Fund, County of Ayr Ladies' Guild at Western House, Ayr, 8 p.m.

22nd and 23rd (Thurs. and Fri.). B.V.A. Conference on Supplements and Additives in Animal Feedingstuffs at the Victoria Halls, Bloomsbury Square, London, W.C.1.

Autumn Meeting of the Dumfries and Galloway Division in the Crown and Mitre Hotel, Carlisle, 2.15 p.m.

26th (Monday.). Annual Dinner of the Centaur Society at the Grand Hotel, Bristol, 7 p.m.

28th (Wed.). Meeting of the South-East Midlands Veterinary Medical Association at Franklin's Gardens Hotel, Northampton, 7.30 p.m.

30th (Fri.). Ordinary General Meeting of the Royal Counties Division, B.V.A., at the Caversham Bridge Hotel, Reading, 2.30 p.m.

December

4th (Tues.). Special Meeting of the Technical Development Committee, B.V.A., at 7, Mansfield Street, London, W.1, 10.30 a.m., to discuss bovine mastitis.

5th (Wed.). Meeting of the Ayrshire Division in the Veterinary Investigation Dept., West of Scotland Agricultural College, Auchincruive, 7.30 p.m.

6th (Thurs.). General Meeting of the Central Division, B.V.A., at the Royal Veterinary College, Camden Town, N.W.1, 6 p.m.

General Meeting of the Western Counties Division, B.V.A., at the Rougemont Hotel, Exeter, 2.30 p.m.

7th (Fri.). Second Meeting of the British Veterinary Poultry Association in the main conference room at Olympia, London, 3 p.m.

20th (Thurs.). Annual Dance of the V.V.B.F. Ladies' Guild, Dumfries Division, in the Cairndale Hotel, Dumfries.

January

24th (Thurs.). Annual Dinner and Dance of the V.V.B.F. (Northern Division) in the Northern Hotel, Aberdeen, 7.30 p.m.

FOOT-AND-MOUTH DISEASE

The area described in the schedule below is declared to be an Infected Area for the purpose of preventing the spread of foot-and-mouth disease:—

An area comprising:—

The City and County Borough of Cardiff.

The County Borough of Newport.

IN THE COUNTY OF GLAMORGAN

The Petty Sessional Division of Caerphilly Lower.

In the Petty Sessional Division of Caerphilly Higher: So much of the parish of Gelligaer as lies within the Petty Sessional Division and to the south of the main road (A.465) running from Abergavenny to Merthyr Tydfil excluding the said road.

In the Petty Sessional Division of Kibbor: The parishes of Whitchurch, Lisvane, and Llanedeyrn and so much of the parish of Eglwysilan as lies within the Petty Sessional Division.

IN THE COUNTY OF MONMOUTH

The Petty Sessional Division of Caerleon.

In the Petty Sessional Division of Newport: The parishes of Henllys, Risca, Machen Upper, Machen Lower, Bettws, Rogerstone, Graig, Michaelstone-y-Vedw, Duffryn, Coedkernew, Marshfield, St. Mellons, Peterstone Wentiloog, St. Bride's Wentiloog, Nash, Whitson, Goldcliff, Llanwern, Bishton, Llandevenny, Langstone, Wilcrick, Llanmartin, Penhow and Kemeys Inferior and so much of the parish of Bedwas as lies within the Petty Sessional Division.

In the Petty Sessional Division of Bedwellty: The parishes of Aberystruth, Rhymney, Bedwellty, Abertillery, Mynyddislwyn, and Abercarn and so much of the parish of Bedwas as lies within the Petty Sessional Division and so much of the parishes of Ebbw Vale and Tredegar as lie to the south of the main road (A.465) running from Abergavenny to Merthyr Tydfil excluding the said road.

In the Petty Sessional Division of Pontypool: The parishes of Blaenavon, Goetre Fawr, Abersychan, Llanhilleth, Pontypool, and Panteg and so much of the parish of Llanbadoc Fawr as lies within the Petty Sessional Division.

In the Petty Sessional Division of Usk: So much of the parishes of Llanbadoc Fawr and Llangybi Fawr as lie within the Petty Sessional Division and so much of the parish of Llantrisant Fawr as lies to the south and west of the road running from Usk via Llanllowell and Pen-y-cae-mawr to Llanvair Discoed excluding the said road.

ADDRESSES OF DISEASE INFECTED PREMISES

The list given below indicates, first the county in which are situated the premises on which disease has been confirmed, followed by the postal address and date of outbreak.

Anthrax

Ches. Deers Green Farm, Smallwood, Sandbach (Nov. 6); Rock Farm, Burwardsley, Chester (Nov. 10).
Lancs. 65, Parliament Street, Liverpool, 8 (Nov. 6).
Northumberland. Bent House, Tarset, Hexham (Nov. 6).
Oxford. Hunts Copse Buildings, Finstock (Nov. 8).
Salop. Longslow House Farm, Longslow, Market Drayton (Nov. 5).
Staffs. Thorn Tree Farm, Marchington, Uttoxeter (Nov. 8).
Sussex. Brownings Farm, Cowfold, Horsham (Nov. 10).

Fowl Pest

Bedford. Lodge Farm, Eaton Bray, Dunstable (Nov. 9).
Essex. Little Maltings, Abbots Lane, Eight Ash Green, Colchester (Nov. 7).
Lancs. Birtledene, 178, Southport Road, Scarisbrick, Ormskirk; The Bungalow, Ratten Lane, Hutton; Baywood, Pilling; 2, Wheel Lane, Pilling; Siddall House, Cowhill, Grimsargh (Nov. 6); Briarfield, Liverpool Road, New Longton, Preston; Beesley House, Haighton, Grimsargh; Beech House, Brown Hill Lane, Longton; Woodfield, Liverpool Road, New Longton; Avenue Farm, off Hesketh Lane, Tarleton; Fairfield, Liverpool Road, Hutton; Westfield Farm, Goosnargh, Preston (Nov. 7); Chapel House Farm, Elston Lane, Grimsargh; Nook End Farm, Mere Brow, Tarleton (Nov. 8); Tabby Nook, Mere Brew, Tarleton, Preston; The Pines, Gill Lane, Longton; Brook House, Shirley Lane, Longton; Land Buildings, Yarrow Mill, Chorley (Nov. 9); Parklands, Liverpool Road, Hutton (Nov. 10).
Norfolk. Manor Farm, Larling, Norwich; Watton Road, Hingham, Norwich (Nov. 9); 6, Yaxham Road, East Dereham (Nov. 10).
Yorks. 8, Crofton Terrace, Main Street, Shadwell, Leeds (Nov. 6). White Lea Poultry Farm, Mytholmroyd, Halifax (Nov. 8).

Swine Fever

Berks. Grayham Poultry Farm, Oakley Green, Windsor (Nov. 6).
Essex. Pamree, Lodge Lane, Collier Row, Romford (Nov. 7)
Hants. Pamber Farm, Pamber (Nov. 9).
Monmouth. Piggery, Blaencwn Farm, Machen, Newport (Nov. 8).
Norfolk. Church Meadows, Helhoughton, Fakenham (Nov. 9).

CORRESPONDENCE

The views expressed in letters addressed to the Editor represent the personal opinions of the writer only and their publication does not imply endorsement by the B.V.A.

Christmas Appeal

Sir,—It is usual at this time of the year to appeal through your columns for support to the Special Gift a/c so that the gifts we send early next month to the recipients of the Fund will enable them to obtain those little extras which will make their Christmas a happier one.

May we therefore ask Members please to send a donation, however small, to the Secretary, Victoria Veterinary Benevolent Fund, 10, Red Lion Square, London, W.C.1, marked "Special Gift a/c."

Yours faithfully,
H. W. DAWES, *President.*
J. McCUNN, *Hon. Treasurer.*
J. J. DUNLOP, *Hon. Secretary.*

Victoria Veterinary Benevolent Fund,
10, Red Lion Square,
London, W.C.1.
November 15th, 1956.

Content of "The Veterinary Record"

Sir,—For some time I have been tempted to write to you concerning the subject matter which appears week after week in THE VETERINARY RECORD, very

little of which is of any interest to the practitioner even if he were fortunate enough to understand what the authors are trying to prove. The only interest THE VETERINARY RECORD has for me, apart from getting it for nothing, is the correspondence, and the news about which of my colleagues have got married and had babies.

It is certainly not necessary for THE VETERINARY RECORD to continue to publish these highbrow papers, and I consider myself fortunate in that every quarter I receive, in particular, a copy of the State Veterinary Journal and also the May & Baker and Bayer publications. It is a pleasure to sit in an armchair in the evening to read and enjoy them, even though I may be tired, because the subject matter is of interest. They are written in a readable manner, and technicalities are kept to a minimum.

This letter is not meant as a criticism of you, Sir, because you cannot publish what you don't get, but I think that if you were to request articles from various veterinary surgeons on aspects, outlooks, and opinions of veterinary life in general, you might be able to get a VETERINARY RECORD one could look forward to.

My last clinical communication concerned a spontaneous fracture of the patella in the greyhound. This was turned down by your consultant as being too common a condition to publish (I didn't know at that time the condition existed and I am sure there must have been other veterinary surgeons as ignorant in the matter as I). The point I wish to make is, how can a veterinary surgeon, or a veterinary student for that matter, learn about these common conditions except through THE VETERINARY RECORD?

Yours faithfully,

SIDNEY S. NYE.

The Surgery,
230, South Street,
Romford,
Essex.

November 9th, 1956.

Control of the Ox Warble Fly

Sir,—A note in THE VETERINARY RECORD (1956) reporting a meeting of the European Productivity Agency of O.E.E.C. mentioned the necessity for a unified research programme aimed at discovering a therapeutic agent which could be used to control the warble fly larva before it appeared in the back of the animal.

At Weybridge some work has in fact been conducted along these lines following a report by Worden (1953) describing promising results obtained by the use of a proprietary anthelminthic substance—a mixture of phenothiazine, hexachloroethane, and an organic tin compound. This mixture, which was given as a drench to cattle during the winter months, was stated by Worden to have brought about a marked reduction in the incidence of infestation.

As a result of this report, field trials of (a) the proprietary anthelminthic substance, and (b) its component parts, were arranged at Weybridge and were carried out by members of the Veterinary Investigation Service in different parts of England and Wales.

During the 1953-4 season, eight Veterinary Investigation Centres took part in the trial, the following substances being tested:—

The proprietary anthelminthic mixture.
Commercial-grade phenothiazine.
Hexachloroethane.
Purified phenothiazine.
Residues from the purification of phenothiazine.
The wetter used in commercial phenothiazine.
The organic tin compound used in the proprietary mixture.

The doses of the proprietary mixture used were calculated according to the makers' instructions. The component substances were given in proportionate amounts. Treatments were given in December and January of the winter 1953-4, and the results assessed by examination of the cattle in the following spring. Either the proprietary mixture or the crude phenothiazine was used in the majority of the tests. Of 297 cattle treated with the mixture, 180 (61 per cent.) were found to be infested, as compared with 146 (52 per cent). of 280 untreated animals. Of 177 cattle treated with phenothiazine, 109 (62 per cent.) became infested as compared with 132 (58 per cent.) of 229 untreated animals.

In none of the tests carried out in 1953-4 was there any evidence that the rate or extent of infestation was altered by the use of the drugs.

During 1954-5 further trials were conducted at nine Veterinary Investigation Centres, 16 herds of cattle being involved. On this occasion the proprietary mixture was the only therapeutic substance used. Treatment was carried out more frequently than in the 1953-4 trial, most cattle receiving five or six doses, starting, in different herds, in October, November, or December, and continuing until January, February, or March.

Of 383 treated cattle, 239 (62 per cent.) were subsequently found to be infested. Of 381 untreated cattle, 234 (61 per cent.) similarly showed infestation. At one Centre the precise counting of the warbles was abandoned because the rate of infestation, in both treated and untreated animals, was so high. During the examination of cattle in the trials both species of warble—*Hypoderma bovis* and *H. lineatum*—were identified. It was clear that under the conditions of our field trials, the proprietary mixture had no effect whatsoever on the development of the warble-fly larva in cattle.

Research along similar lines with other therapeutic substances may, of course, lead to more satisfactory results.

Yours faithfully,

S. BRIAN KENDALL.

Ministry of Agriculture, Fisheries and Food,
Veterinary Laboratory,
New Haw,
Weybridge,
Surrey.

October 17th, 1956.

References

ANON. *Vet. Rec.* (1956). **68.** (32). 539.
WORDEN, A. N. (1953). *Ibid.* **65.** (36). 586.

Dehorning Calves with Collodion

Sir,—A similar condition to that reported by your correspondent Mr. W. J. Jones Davies occurred in this practice in two Ayrshire calves on one premises.

Following the use of dehorning collodion these calves became ill. Symptoms were: temperature 106° to 107°; inappetence; in one calf a partial paralysis of one hind limb, and one ear hanging lower than the other. The second calf showed inability to rise. In each calf, when the dead skin was removed from the horn bud site, a deep wound was observed. Meningitis was diagnosed. The condition failed to respond to antibiotics or sulphonamides.

After several weeks the calf with the unilateral paralysis died. *Post-mortem* examination showed localised inflammation extending through the skull into the meninges, and was more marked on one side than the other.

The manufacturers of the dehorning collodion were approached and they purchased the remaining calf for *post-mortem* examination. They reported, however, that no abnormality was found.

A further case was encountered on another premises but symptoms were not so acute and response was obtained to removal of the dead skin over the horn bud site, and local applications of heat and penicillin ointment. The illness lasted for one week.

Yours faithfully,

D. V. SINCLAIR.

Southwoods Hall,
Thirsk,
Yorkshire.

November 11th, 1956.

ACTH in the Treatment of Acute Induration of the Bovine Udder

Sir,—In answer to the query in THE RECORD of November 10th, the following are details of the use of ACTH in the case I described.

The drug was administered by the intramuscular route, a minimum of 100 I.U. being used, followed by 50-100 I.U. 48 hours later.

I can only add that I regret that the original text did not make this clear.

Yours faithfully,

J. C. HINDSON.

Skrinkhills,
Tiverton,
Devon.

November 10th, 1956.

The Value of Nitrofurazone in Experimental *Eimeria tenella* Infection of Chickens

Sir,—A recent article (Arundel & Sutherland, 1956) which describes the coccidiostatic effect of nitrofurazone under experimental conditions indicates differences in results from those previously reported by Davies & Kendall (1955). The authors suggest as a possible explanation the existence in Britain of a strain of *Eimeria tenella* abnormally resistant to nitrofurazone. It seems advisable to consider other possible reasons for discrepancies between the two investigations.

1. In their 1955 paper Davies & Kendall compared the coccidiostatic effects of sulphadimidine and nitrofurazone and on the evidence that the rate of mortality following treatment with nitrofurazone was considerably greater than with sulphadimidine concluded that the latter drug was a more effective coccidiostat. It is clearly essential in this type of observation to show a significant difference in response to the two types of treatment. In the experiment reported by Arundel & Sutherland (*loc. cit.*), Table I, no deaths occurred whichever treatment was used, and there was only a 50 per cent. mortality among untreated birds. The only deduction to be drawn from this type of evidence is that both sulphadimidine and nitrofurazone have some coccidiostatic effect. This conclusion has, of course, been reached by numerous previous workers. Evidence as to the rate of growth of the birds, unless attributable to the effects of the parasite, is clearly irrelevant to the experimental investigation under consideration.

2. There are several possible explanations for a failure to induce a consistently high rate of mortality among experimentally infected, untreated birds. Among these may be mentioned variation in the susceptibility of the experimental stock (usually as a result of adventitious infection) and loss in virulence of the infective inoculum. There is unfortunately no reliable means of assessing the viability of coccidial oocysts except a biological test with a high rate of mortality.

The suggestions made by Arundel & Sutherland (1956) that there exists in Britain a drug-fast strain of *E. tenella* is nevertheless of the greatest interest and has been under investigation at Weybridge. There is no reason to believe, however, that the strain of *E. tenella* used for earlier investigations is abnormal in this respect. Over the past nine years the methods used in this laboratory have ensured that the stock strain of *E. tenella* is never exposed to drug action. Furthermore, recent attempts by one of us (L. P. J.) to induce drug-fastness to nitrofurazone have demonstrated that this original strain of *E. tenella* may develop an apparent decrease in susceptibility to this drug.

Yours faithfully,

S. B. KENDALL,
S. F. M. DAVIES,
L. P. JOYNER.

Ministry of Agriculture, Fisheries and Food,
Veterinary Laboratory,
New Haw,
Weybridge,
Surrey.

November 5th, 1956.

References

ARUNDEL, J. H., & SUTHERLAND, A. K. (1956). *Vet. Rec.* **68.** 769.
DAVIES, S. F. M., & KENDALL S. B. (1955). *Ibid.* **67.** 867.